J. M. CRAWFORD.

Apparatus for Automatically Raising and Lowering Gas-Flames.

No. 218,237. Patented Aug. 5, 1879.

Fig. 1

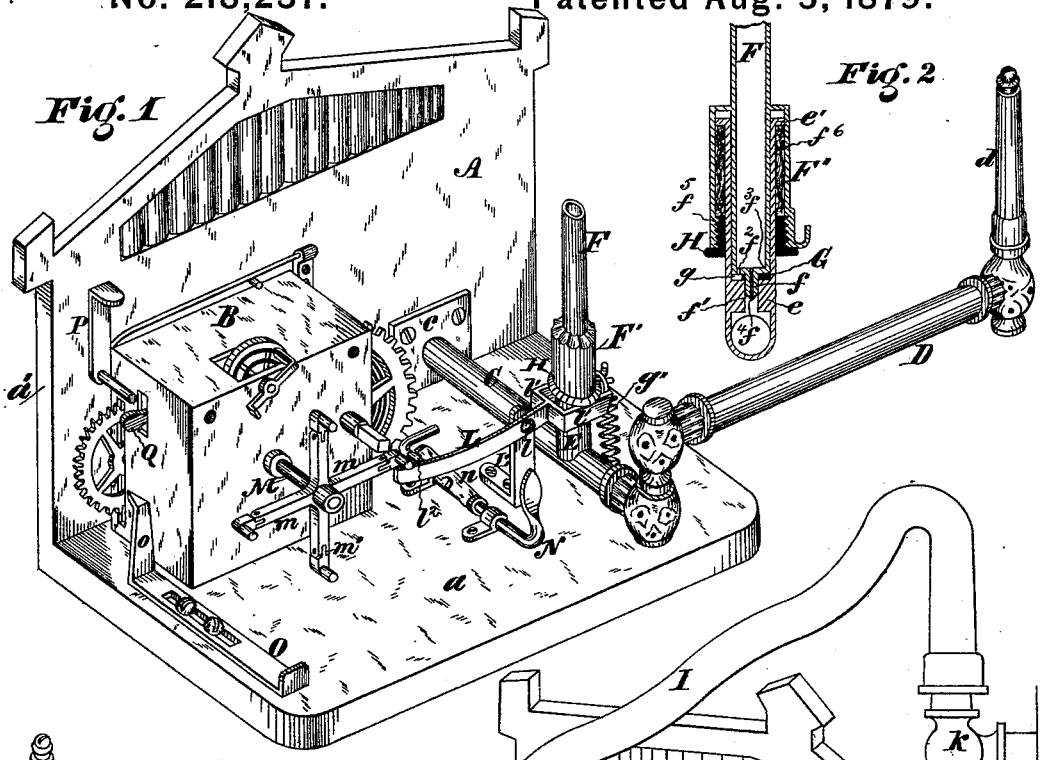

Fig. 2

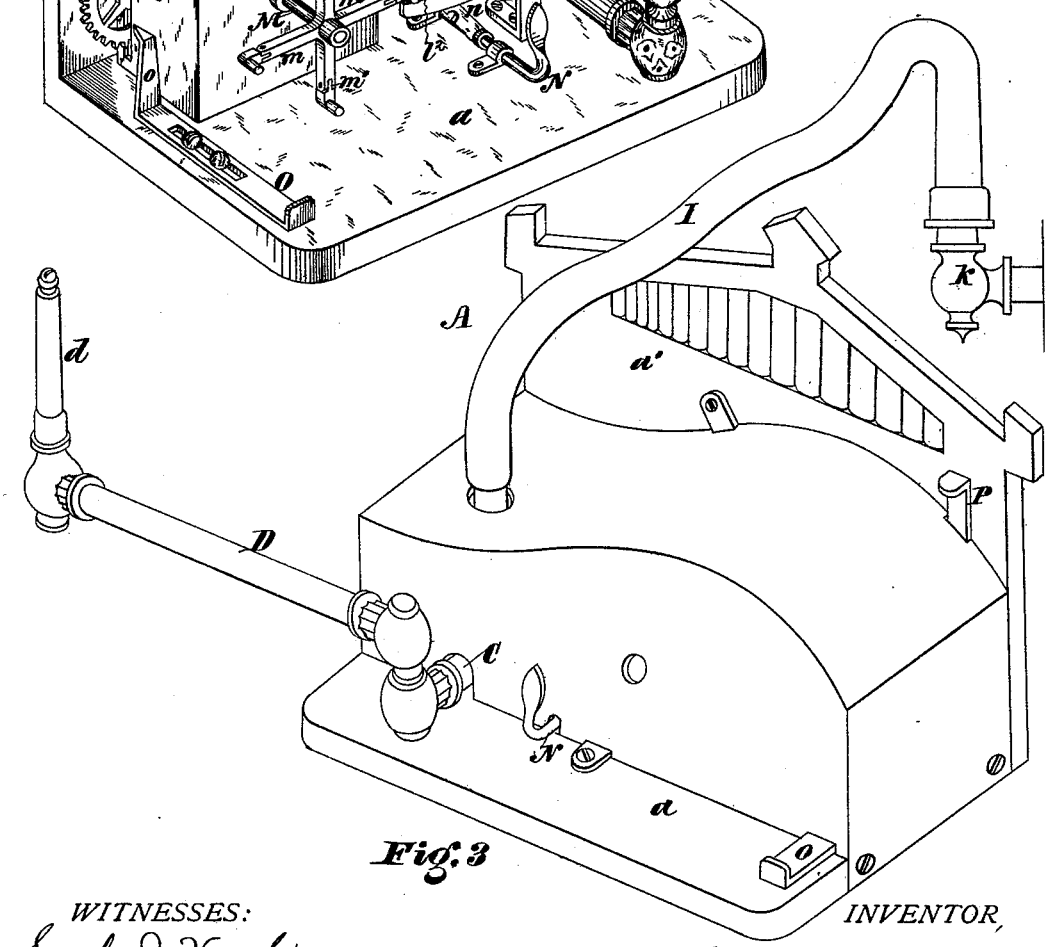

Fig. 3

WITNESSES:

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JOHN M. CRAWFORD, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR AUTOMATICALLY RAISING AND LOWERING GAS-FLAMES.

Specification forming part of Letters Patent No. **218,237**, dated August 5, 1879; application filed May 2, 1879.

To all whom it may concern:

Be it known that I, JOHN M. CRAWFORD, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Automatically Raising and Lowering Gas-Flames; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a perspective of my invention. Fig. 2 is a vertical sectional detail of the valve; and Fig. 3 is a perspective of my invention illustrated as applied to a fixed burner.

The object of my invention is to provide means whereby at regulated intervals the flow of gas at a burner may be varied, so as to burn a full flame for a short period and then be turned down to a faint glimmer or spark for a longer period, such variations continuing as long as may be desired.

My improvements consist in the peculiar construction and combination of parts hereinafter referred to, having relation especially to the provision of a valve of peculiar construction operated from clock-work in such a manner that the flow of gas to a burner provided for that purpose can be governed so as to feed enough for a full flame, or a quantity only sufficient to support a spark or faint glimmer.

Referring to the accompanying drawings, A indicates a portable bracket of any suitable construction, which I have shown as composed of a base, *a*, and side *a'*.

B represents a clock-work mechanism of any suitable construction, and the details of which need not therefore be particularly described. I would remark, however, that I have shown in the drawings and give preference to clock-work driven by a mainspring and provided with a balance-spring.

C represents a short section of gas-pipe having a blank end fastened to a plate, *c*, which is screwed to the side of the bracket A. To the opposite end of said pipe is attached a fixture, D, with burner *d*.

E represents a branch of the gas-pipe C, to which the regulating-valve is applied. Said valve consists of a sliding plug, F, having stem *f*, with point f^1, which has its seat in a diaphragm, *e*, in the branch E. The plug F, which is hollow, has an opening, f^2, in the shoulder f^3 of sufficient size to permit the escape of enough gas to the burner *d* to support a full flame thereat, while the point f^1 has an opening, f^4, so small as to afford exit to only enough gas to maintain a spark or glimmer at said burner.

G is an india-rubber washer surrounding the stem *f*, and adapted to close the opening f^2 when the valve is pressed down upon its seat, being notched or cut away at *g*, if desired; and *g'* is a spring for holding down said valve. One end of said spring is fastened to the base *a* and the other to a hook on a fixed sleeve, F', attached to and forming a stuffing-box with packing f^6 for the plug F. Said sleeve is threaded at f^5 to engage with a loose screw-collar, H, which encircles the stem E below its beaded or flanged upper edge, *e'*. When the sleeve F' is screwed into the collar H the valve has liberty of vertical movement, as hereinafter set forth, being held down normally to its seat by the spring *g'*. The upper end of the plug F is open, and is designed to be connected by a flexible tube, I, with a burner, *h*, of any common or stationary gas-fixture, receiving its supply of gas therefrom.

L represents a lever having a pivoted fulcrum at *l* on a standard, L'. Said lever is bifurcated at one end, forming branches l^1 l^1, which embrace the branch E below the collar H. When the opposite end of said lever is depressed the valve is raised from its seat, uncovering the opening f^2 and permitting gas to pass through the same to the burner *d*. When no pressure is exerted on said lever the spring *g'* holds said valve down to its seat, and then the gas is allowed to flow to said burner only through the opening f^4. When the valve is raised the washer G curls up, so that the gas may escape around its edge in sufficient quantity to supply a full flame. When the valve is lowered the washer is compressed, and then the gas can only pass through the notch, permitting but sufficient flow to support a glimmer of light.

The shaft M (which is the minute-hand shaft of the clock-work) is provided with arms *m m*,

arranged, as shown, to come in contact with the lever L and depress it as they revolve.

In the drawings I have shown four such arms, (though a greater or less number may be used,) each of which will remain in contact with the lever L for about three minutes, said lever being therefore depressed for the same period of time, the valve being then opened and a full flame being maintained at the burner *d*. When said arms in their revolution pass out of contact with the lever L the spring *g'* draws down the valve F to its seat, shutting off the supply of gas through the opening f^2, and reducing the flame at the burner to a spark or glimmer. With this arrangement, therefore, four times in every hour the gas is turned up to produce a full flame, which continues for, say, three minutes, there being only a faint spark or glimmer burning in the intermediate times. By employing more or fewer arms the intervals between the turning on and shutting off of the gas may be varied, and I have accordingly made the arms *m* jointed, as shown at *m'*, so that any one or more of them may be swung out of line of contact with the lever L, thereby permitting adjustment to produce the described changes in the flame once every quarter-hour, half-hour, or hour, as may be desired. With additional arms more frequent changes may be made.

If it be desired at any time to keep the light full at the burner *d* without being affected by the clock-work, the end of the lever L may be depressed out of possibility of contact with the arms *m* by means of a rock-shaft, N, having arm *n*, which meets and depresses a pin, l^2, on said lever.

To maintain the spark at the burner *d* without change, the clock-work may be stopped by means of a slide, O, having a finger, *o*, which engages with one of the gear-wheels of said clock-work.

P represents a spring-arm, which may be depressed to come in contact with the lever Q of the clockwork and start the latter after it has been stopped from any cause.

By means of the foregoing apparatus a valuable adjunct to the sick-room is obtained, as the adjustment of the parts may be so effected as to turn up the gas whenever it is time to administer medicine or give other attention to a patient, such turning up constituting a notice and warning to the nurse or attendant, while during the intervals the gas will be turned down, avoiding the glare of a full flame.

The apparatus will also be of economical service in stores, banks, &c., where, as a precaution against burglars, the gas is usually left burning all night.

With this appliance the gas will be turned on every twelve minutes and burn with a full head for, say, three minutes, the period when the light is turned down, while effecting a considerable saving in gas, being too short to enable nefarious operations to be carried on, and the three-minute illumination every quarter hour forming as efficient a safeguard against intrusion of house-breakers as constant illumination does.

It will be noted that the apparatus is portable, and consequently may be used in the different rooms of a dwelling, as occasion demands. It has also its own burner and valve, and hence the fixtures to which it may be applied require no alteration or change. Besides, I have found by experience that it is impossible to provide any clock-work apparatus to work directly on the key of a common burner and be susceptible of general application.

If desired, a clock-face, with hands and an alarm, may be combined with the described apparatus.

I have shown and described the apparatus as portable; but under some circumstances the principle of construction described may be applied with advantage as a fixture or to remain stationary. In this latter case the chandelier or other equivalent fixture to which the appliance would be attached should be cut so as to permit the introduction of the valve F into its pipe, the valve sliding in the upper portion of the cut pipe and seating in the lower portion, a sleeve connecting said portions, to which should be attached the clock-work.

In the drawings I have shown four arms, *m*, of a peculiar construction; but the number of such arms may be increased or diminished and the construction modified in any suitable manner so long as the idea of adjustment or removability to vary the number of arms coming in contact with the lever L is maintained. So, too, I have spoken of the duration of the periods in which the light is turned down to a glimmer and up to a full flame; but the duration of such periods, it is obvious, may be varied by simply changing the position of the fulcrum of the lever L, or by other obvious means, without departing from the spirit of the invention and keeping strictly within the spirit of the same.

What I claim as my invention is—

1. The portable apparatus for raising and lowering gas-flame, consisting of a suitable bracket, A, having a horizontal supporting-base, clock-work mechanism, with valve and burner, and a flexible tube, I, whereby connection may be readily made with an ordinary gas-burner, substantially as described.

2. The valve composed of hollow plug F, with stem *f*, having shoulder f^3 and openings f^2 f^4, and adapted to the seat *e* in the branch E, substantially as shown and described.

3. In combination with the plug F, the washer G, adapted to close the opening f^2 when the valve is pressed down on its seat, substantially as shown and described.

4. The combination, with branch E, having bead or flange *e'*, of loose screw-collar H and sliding plug F, having threaded sleeve F', substantially as shown and described.

5. The combination of clock-work shaft M, having arm or arms *m*, with lever L, spring *g'*, and slide-valve F, substantially as shown and described.

6. In combination with shaft M, arms *m m*, jointed at *m'*, substantially as and for the purpose set forth.

7. In combination with lever L, rock-shaft N, having arm *n*, adapted to engage with stud l^2 and depress said lever out of contact with arms *m' m'*, substantially as shown and described.

8. The combination, with clock-shaft M, of radial arms *m*, having means of adjustment whereby they may be brought into or moved out of line of contact with lever L, for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of April, 1879.

JOHN M. CRAWFORD.

Witnesses:

GEO. C. SHELMERDINE,

M. D. CONNOLLY.